NASA's Exploration Work Assignments
Ames Research Center

NASA is embarking on a grand challenge of space exploration that can only be achieved by effectively implementing and aligning work for the Vision for Space Exploration. This challenge requires a balanced workforce skill mix and productive NASA centers. NASA is distributing work assignments to the centers to ensure that the agency can begin to meet the challenges of exploration while maintaining ten healthy and productive centers.

The Ames Research Center, Moffett Field, Calif., one of NASA's research centers, has been given the responsibility as lead to manage the contractor work package for the Crew Exploration Vehicle's (CEV) thermal protection system advanced development project.

In addition, Ames's responsibilities for the CEV will include:

- Aero/Aero-thermal database development team
- Flight software and CEV guidance, navigation and control support.

ARC is also given responsibilities for the Crew Launch Vehicle (CLV) including:

- Expertise in integrated systems health monitoring including design and development phase health monitoring requirements analysis, CLV element fault detection algorithms development, and design, development, test and evaluation, and validation and verification tools development
- Support reliability assessment with simulations
- Ascent abort computational fluid dynamics blast analysis

In the mission operations area, Ames will:

- Provide exploration tools for flight controllers.
- Develop new applications to future requirements for the Constellation training program.
- Support design, development, test and evaluation of multi-center command & control systems, human-machine interaction requirements, mission control software development, project planning and management software systems and documentation systems

Level II or project tasks include:

- Safety Reliability & Quality Assurance - Development of problem reporting and corrective action and safety and mission assurance information systems
- Systems Engineering and Integration - Support to human factors and human rating; flight performance; thermal & environmental control and life support; command, control, communication and information; and extravehicular activity systems; and ground/mission operations systems integration groups
- Test and verification - Support to human factors and human rating, integrated thermal/environmental control and life support; command, control, communication and information test and verification; and avionics software test and verification systems integration groups.
- Advanced Projects Office - Support architecture refinement and conceptual design of future elements

In support of exploration and the Lunar Precursor and Robotic Program Ames will:

- Establish a lunar projects office with the responsibility for developing small spacecraft to support exploration.
- Continue to lead the development of the Lunar Crater Observation and Sensing Satellite.
- Lead the information technology effort for the Exploration Systems Mission Directorate's collaborative work environment.

NASA's Exploration Work Assignments
Dryden Flight Research Center

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The Dryden Flight Research Center, Edwards, Calif., one of NASA's flight research centers, has been given the responsibility as lead to manage the Crew Exploration Vehicle's (CEV) abort flight test integration and operations.

In addition, Dryden's responsibilities for the CEV will include:

- Abort test booster procurement
- Flight test article and abort test booster integration
- Flight test article design, assembly, integration and testing
- Independent analysis and oversight of prime contractors flight test articles

DFRC was also given responsibility to support ground operations by providing preliminary definition and planning for CEV launch abort systems tests, drop tests, landing and recovery tests; flight re-entry and landing profiles; and range safety requirements and integration.

Level II or project tasks include:

- Systems Engineering and Integration - Support to the command, control, communication and information systems integration group
- Test and verification - Support flight test planning

NASA's Exploration Work Assignments
Glenn Research Center

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The Glenn Research Center in Cleveland, one of NASA's premier aeronautics research centers, has been given the responsibility as lead to manage the contractor work package for the Crew Exploration Vehicle's (CEV) service module and spacecraft adapter integration.

The service module is a vital element of the CEV. It will provide major maneuvering capability with a propulsion system, generate power using solar arrays, and keep the vehicle cool with heat rejection radiators.

Glenn's responsibilities also will include:

- Oversight and independent analysis of the CEV prime contractor
- Flight test article and pathfinder production for the service module and spacecraft adapter
- Integration analysis and systems engineering and integration

Glenn was also given lead responsibilities for the Crew Launch Vehicle upper stage, including:

- Design and develop the thrust vector control subsystem
- Design and develop the electrical power and power distribution system
- Developmental flight instrumentation package
- Leak detection sensors development
- Purge system
- Hazardous gas detection system
- Upper stage systems engineering and integration
- J-2X engine thermal/vacuum testing at Glenn's Plum Brook Facility
- Vehicle integration design analysis support

The center will also take the lead in the development of upper stage module for the advanced development flight test-0.

Level II or project tasks include:

- Safety Reliability & Quality Assurance (SR&QA) - Lead for failure mode and effects analysis integration and program trends analysis; support for document maintenance, program trending, integrated hazards analysis, and quality audits. Represent SR&QA at assigned systems integration groups.
- Systems engineering and integration - Integrated power systems integration group co-lead, book manager for several system requirements review interface requirements document; support to analysis & trades and process & tools office; and support to flight performance; thermal & environmental control and life support; command, control, communication and information; and extravehicular activity systems integration groups.
- Test and verification - Lead for electrical power test bed definition/architecture; lead for power systems integration groups; support to avionics test architecture
- Advance Projects Office - Support architecture refinement and conceptual design of future elements

NASA's Exploration Work Assignments
Goddard Space Flight Center

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The Goddard Space Flight Center, Greenbelt, Md., one of NASA's science centers, has been given responsibility for communications, tracking and support mechanisms for the Crew Exploration Vehicle (CEV).

In addition, Goddard will have responsibility for Level II or project tasks including:

- Safety Reliability & Quality Assurance (SR&QA) - Level II software safety and assurance; Represent SR&QA at assigned systems integration groups
- System engineering & integration - Navigation system integration group co-lead; software and avionics system integration group co-lead, support to flight performance and communications, command, control and intelligence system integration groups
- Test & Verification (T&V) - Communications, command, control, and intelligence T&V system integration group lead, navigation and tracking T&V system integration group lead, book manager for software verification and validation plan; support to avionics, radio frequency link testing, and interface verification requirements
- Support architecture refinement and conceptual design of future elements.

In support of lunar exploration, Goddard will:

- Continue developing the Lunar Robotic Orbiter mission for launch in late 2008.

NASA's Exploration Work Assignments
Jet Propulsion Laboratory

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The Jet Propulsion Laboratory, Pasadena, Calif., one of NASA's premier science centers, has been given mission operations lead responsibility for developing a systems engineering process for operations development. This is a multi-center activity to lay out a road-map for the systems engineering processes related to operations development and preparation for the new program.

In addition to JPL's responsibilities for mission operations, the center will provide support to the CEV thermal protection system advanced development project.

Level II or project tasks include:

- Safety Reliability & Quality Assurance (SR&QA) - Support for integrated hazard analysis and probability risk assessment. Represent SR&QA at assigned systems integration groups.
- Systems engineering and integration software and avionics systems integration group co-lead; support to requirements, analysis & trades, and process & tools offices; support to navigation & tracking; power; command, control, communication and information; human factors; and ground/mission operations systems integration groups
- Test and verification - Support to the master verification plan; Constellation environmental qualification and acceptance test requirements; and master test and verification. Support to command, control, communication and information, test and verification and avionics software test and verification systems integration groups
- Advance Projects Office - Support architecture refinement and conceptual design of future elements

NASA's Exploration Work Assignments
Johnson Space Center

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The Johnson Space Center, Houston, one of NASA's premier space centers, has been given program management responsibility for the Constellation Program, the program that is critical to our nation’s plans for humans to explore the frontiers of space.

Specifically, Johnson's responsibilities include:

Program Management for the Constellation Program

- Manage and integrate Crew Exploration Vehicle (CEV), Crew launch Vehicle(CLV)/Cargo Launch Vehicle (CaLV), ground operations, mission operations, exploration communication and navigation systems, and future projects (e.g., extra vehicular activity and lunar lander)

CEV

- Overall project management and integration – CEV prime contract management
- Lead for crew module and vehicle integration, including contractor oversight and independent analysis
- CEV government provided hardware
- Flight test execution

CLV

- Flight operations support to CLV including lead of first stage recovery system modification activities, upper stage reaction control system development and certification testing, and abort certification for all phases of CLV flight.
- Support separation certification for all phases of CLV flight, CLV reliability and safety assessments including launch site function, CLV mission operations planning to the operations integration organization, and avionics simulation development

Mission Operations

- Project management
- Development of capabilities and planning for mission operations, crew training, and the mission control center for ESMD human space flight missions. Will be coordinated closely with SOMD as they will be responsible for operation of these vehicles.

Commercial Orbital Transportation Service

- JSC is working with industry to demonstrate their ability to transport cargo and crew to support the International Space Station.
- NASA plans to aggressively pursue cost-effective, commercial cargo and crew services for the ISS and will welcome and use those services once they have been successfully demonstrated

NASA's Exploration Work Assignments
Kennedy Space Center

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The Kennedy Space Center, Fla., one of NASA's space centers, has been given project management responsibility for ground operations, an element that is critical to our nation's plans for humans to explore the frontiers of space.

Additionally, Kennedy's responsibilities include:

Ground Operations

- Responsible for achieving all ground operations objectives for the agency allocated to the launch and landing sites.
- Leads design, development, testing & evaluation and logistics activities for all ground processing, launch and recovery systems
- Leads ground processing, launch and landing operations planning and execution

Crew Exploration Vehicle (CEV)

- Provides ground processing, launch operations and recovery support during design, development, test, and evaluation phases of CEV.
- Ground support equipment development support
- CEV prime contractor oversight and independent analysis

Crew Launch Vehicle (CLV)

- Provides ground processing, launch operations and recovery support during design, development, test, and evaluation phases of CLV and Cargo Launch Vehicle
- Performs prime contractor insight and independent analysis
- Leads launch operations planning and execution for advanced development test flight-0 and other flight demonstrations

Level II or project tasks include:

- Co-lead for systems engineering & integration ground/mission ops and supportability system integration groups
- Safety, Reliability, & Quality Assurance (SR&QA) - Support integrated hazards analysis and preliminary hazard analysis. Support risk management, quality assurance, and development of safety software system. Represent SR&QA at assigned systems integration groups.
- Test &Verification - Support integrated element and end-to-end testing
- Advance Projects Office - Support architecture refinement and conceptual design of future elements

NASA's Exploration Work Assignments
Langley Research Center

NASA is embarking on a grand challenge of space exploration that can only be achieved by effectively implementing and aligning work for the Vision for Space Exploration. This challenge requires a balanced workforce skill mix and productive NASA centers. NASA is distributing work assignments to the centers to ensure that the agency can begin to meet the challenges of exploration while maintaining ten healthy and productive centers.

The Langley Research Center in Hampton Roads, Va., one of NASA's premier aeronautics research centers, has been given the responsibility as lead to manage the contractor work package for the Crew Exploration Vehicle's launch abort system integration, with prime contractor oversight and independent analysis.

Additionally, Langley will have responsibility for:

- Flight test and pathfinder articles production for command module, launch abort system and separation rings
- Lead the command module Landing System Advanced Development Project
- Support the Thermal Protection System Advanced Development Project
- Provide aero/aerothermal; guidance, navigation and control, avionics software; and displays & controls support
- Provide independent analysis and systems engineering and integration support
- Exploration Space Research Technology program

Langley also was given lead responsibilities for the Crew Launch Vehicle including:

- Aerodynamic characterization of integrated launch vehicle stack, aerodynamic database development, and aeroelasticity test and analysis
- Vehicle integration activities for the advanced development flight test-0. Crew Exploration Vehicle's module development for the flight test
- Support structural design and analysis, guidance, navigation, and control development, flight mechanics, and trajectory analyses
- Provide systems engineering support
- Support upper stage design, development, testing, and evaluation

Level II or project tasks include:

- Safety Reliability & Quality Assurance (SR&QA) - Support for integrated hazard analysis, probability risk assessment; represent SR&QA at assigned systems integration groups.
- Systems Engineering and Integration - Structures systems integration group co-lead and technical performance measurement lead**;** support to requirements, interface, analysis & trades and process & tools offices; support to software & avionics, and flight performance systems integration groups.
- Testing and Verification (T&V) - T&V flight test and performance planning; support integrated loads, structures & mechanics; command, control, communication, and information T&V; avionics software T&V systems integration groups; and flight test planning support
- Advanced Projects Office - Support architecture refinement and conceptual design of future elements

NASA's Exploration Work Assignments
Marshall Space Flight Center

NASA is embarking on a grand challenge of space exploration that can only be achieved by effectively implementing and aligning work for the Vision for Space Exploration. This challenge requires a balanced workforce skill mix and productive NASA centers. NASA is distributing work assignments to the centers to ensure that the agency can begin to meet the challenges of exploration while maintaining ten healthy and productive centers.

The Marshall Space Flight Center, Huntsville, Ala., one of NASA's premier space flight centers, has been given project management responsibility for the new Crew Launch Vehicle (CLV) and Cargo Launch Vehicle (CaLV), both critical elements to our nation’s plans for humans to explore the frontiers of space.

Specifically, Marshall's responsibilities include:

- Responsible for achieving all CLV and CaLV objectives for the agency.
- Lead associated systems engineering & integration activities, all CLV & CaLV safety and mission assurance activities, upper stage design, development, testing, and evaluation activities.
- First stage design and upper stage engine development contracts management, as well as leading or otherwise overseeing CLV associated demonstration testing.
- Responsibility for advanced development flight test-0 and other flight demonstrations.
- Support responsibilities for the Crew Exploration Vehicle.
- Support for launch abort systems, service module, and abort test booster

Level II or project tasks include:

- Safety, Reliability & Quality Assurance (SR&QA) - Support integrated hazards analysis and probabilistic risk assessment; represent SR&QA at assigned systems integration groups; support quality assurance, risk management, and safety software system development; support Constellation SR&QA panels.
- System engineering & integration: Co-Lead for several system integration groups including thermal and environmental control and life support, environments, human factors/human rating, loads and structures
- Test and verification lead for loads/structures and environments system integration group

In support of lunar exploration Marshall will:

- Establish a Lunar Precursor and Robotic Program Office, which includes the Lunar Reconnaissance Orbiter and the Lunar Crater Observation and Sensing Satellite.
- Establish a Lunar Lander Project Office, under the Constellation Program, responsible for performing early trade studies and developing requirements for the Lunar descent stage.
- Plan to use the Michoud Assembly Facility for CLV and CaLV tank construction

NASA's Exploration Work Assignments
Stennis Space Center

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The Stennis Space Center, Miss., one of NASA's premier space centers, has been given responsibilities for the new Crew Launch Vehicle (CLV), a critical element in our nation’s plans for humans to explore the frontiers of space.

Specifically, Stennis' responsibilities include:

CLV

- Serve in a focused program management and integration role for Constellation Systems rocket propulsion testing
- Lead sea level development, certification & acceptance testing for upper stage engine including facility modifications and test operations
- Support altitude development & certification testing for upper stage engine
- Lead sea level development testing for upper stage main propulsion test article which including facility modifications and test operations
- Lead sea level acceptance testing for flight upper stage assembly which includes facility modifications and test operations

Ground Operations

- Support design, development, testing, and evaluation of propellant test and delivery systems, ground engine checkout facility simulation and analysis, engine and launch facility planning and development.

Level II or project tasks include:

- System Engineering & Integration - Support to flight performance systems integration group (propulsion test integration), and systems engineering processes and tools
- Test & Verification - Propulsion test integration and coordination with rocket propulsion test management board.
- Advance Projects Office - Support architecture refinement and conceptual design of future elements.